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PRODUCT GUIDE

SEMICONDUCTOR AND FPD PRODUCTION EQUIPMENT

English Version

TOKYO ELECTRON LIMITED

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TOKYO ELECTRON

A Manufacturer with a Marketing Mind Supported by Leading-edge Technologies Research and Engineering Infrastructure for Next Generation Equipment

Since 1963, Tokyo Electron (TEL) has constantly refined our technological capabilities to provide a continuous stream of state-of-the-art products to satisfy the ever-changing needs of our customers.

Our business has evolved to encompass a full range of functions: marketing, development, manufacturing, sales and field service. The technology and human resources we have developed over the years have earned our customers' solid trust. TEL's products set the standard for world-class excellence. Our leading product line-up includes thermal processing systems, coater/developers, plasma etch systems, surface preparation systems, single wafer CVD systems, plasma processing systems, wafer probers, and metrology technology. Our FPD (Flat Panel Display) production systems draw on our expertise in semiconductor production equipment and claim top market share positions.

Regardless of its country of origin, our equipment consistently incorporates leading-edge technologies and unrivaled development efforts. This enables TEL to be a worldwide leader in the semiconductor and FPD production equipment industry.

In meeting the challenges of device manufacturing, equipment suppliers are faced with the challenge of providing excellent equipment as well as developing fine pattern processes. Timeliness is crucial when incorporating new process technology into production-worthy equipment.

TEL's R&D and engineering facilities support two major functions: development of next-generation process technologies and improvement of equipment reliability and productivity. Development and application of new processes are conducted in close cooperation with customers. Verified processes are then refined until the equipment achieves production-level performance. Our equipment also goes through continuous improvement programs to enhance reliability and productivity. These programs range from parts qualification to CIM integration.

TEL's Process Technology Center provides the industry's most leading-edge facilities for 45nm node and beyond technologies. The center along with other unparalleled R&D and engineering facilities, enables us to provide our customers with the most advanced, reliable and productive equipment.

Globalization and Localization Working Together with Local Partners

TEL has established manufacturing, development, sales and field service offices around the world. As a result, we are strategically located near customers in order to facilitate partnerships and to provide global support locally.

In the United States, the headquarters office in Austin, Texas, serves as the base for service locations. Our new R&D base, TEL Technology Center, America, is located in Albany, New York. Other U.S. subsidiaries provide development and manufacturing services. TEL also has a complete European network, based in Crawley, England, that includes branches in Germany, Italy, Netherlands, Ireland, Israel and France. In Asia outside of Japan, professional and reliable service and support resources are available in Korea, China and Taiwan.

In summary, TEL is committed to offering worldwide support while building solid relationships with our customers, suppliers, employees and stakeholders. We will continue to encourage cross-cultural communication, and take pride in our diversity as a global company.

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TOKYO ELECTRON LIMITED
Research and development of semiconductor production equipment and process integration, development of new business.

TOKYO ELECTRON AT LIMITED
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TOKYO ELECTRON MASSACHUSETTS, LLC
Development and manufacturing of plasma etch systems, research and development of plasma and vacuum technologies.

TEL TECHNOLOGY CENTER, AMERICA, LLC
Research and development of semiconductor production equipment.

TIMBRE TECHNOLOGIES, INC.
Development of optical measurement systems.

*FOUP opener manufactured by Tokyo Electron Limited under the license from Brooks Automation, Inc.

Thermal Processing Systems

With a notable No.1 share in the batch furnace market, TEL is world-renowned for manufacturing the most reliable vertical thermal processing system available. The ALPHA-303i, TEL's 300mm large batch thermal processing solution and an innovative thermal processing system TELFORMULA.

TELFORMULA marges the advantages of batch systems (stability, low CoO) and rapid thermal processing (short cycle times, flexibility), providing the next evolutionary step in thermal processing. TEL announced TELFORMULA IRad and TELINDY, the latest entry model into thermal processing. TELINDY is a new challenge for the best balancing of criticality and productivity. TEL is also currently working with leading logic and memory manufacturers to develop films targeted at the 45nm node and beyond.

TELFORMULA™

Thermal Processing System

The TELFORMULA is an innovative thermal processing system for 65nm and 45nm node generations device production and beyond. The thermal processing system realizes not only short cycle-time, but also improved CoO and process performance.

＜Applications and Features＞

- ■ General Oxidation / Anneal
- ■ Radical Oxidation (LPRO)
- ■ Ultra-thin Gate Dielectric
- ■ LPCVD (POLY, SiN, SiO_2 / in-situ dry gas cleaning capability)
- ■ Ultra low temp, LPCVD
- ■ Ultra low temp, Anneal for BEOL
- ■ High-k dielectrics (AlO, HfO, AlO/HfO, HfSiO)

※TELFORMULA is a registered trademark or a trademark of Tokyo Electron Limited in Japan and other countries.

TELINDY™

Thermal Processing System

Based on TELFORMULA™'s successful platform, the new TELINDY offers short turnaround processing and fully equipped further manufacturability. TELINDY provides 125 wafers/batch process with minimized overhead time and down time.

＜Applications and Features＞

- ■ Fast ramp up and cool down heater
- ■ Same footprint with ALPHA-303i
- ■ Maximized uptime (in-situ dry gas cleaning capability)

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※TELINDY is a registered trademark or a trademark of Tokyo Electron Limited in Japan and other countries.

ALPHA（α）-303i

Thermal Processing System

The ALPHA-303i thermal processing systems realizes superior performance and high productivity. The ALPHA-303i, which maintains the smallest footprint worldwide, is the most reliable mass production equipment in the market to fully comply with GJG/SEMI Standard.

＜Applications and Features＞

- ■ Smallest footprint (1100mm wide) in the market
- ■ Equipped with proven ART (Adaptive Realtime Temperature) Control
- ■ Complies with GJG/SEMI Standards

TELFORMULA™ IRad

Plasma-Enhanced Batch Thermal MLD System

The TELFORMULA IRad was developed based on the TELFORMULA platform and incorporates TEL's proprietary damage free plasma source and low temperature batch processing. Furthermore, IRad's plasma capability can be combined with TEL's Molecular Layer Deposition (MLD) technology. The system also enables development of laminate or nano-scale deposition film, which will be required at the 45nm technology node or beyond.

＜Applications and Features＞

- ■ Minimal damaged plasma assisted MLD process
- ■ Molecular layer deposition of SiN at low temperatures
- ■ Molecular layer deposition of SiO_2 at low temperatures

※TELFORMULA is a registered trademark or a trademark of Tokyo Electron Limited in Japan and other countries.
＊ IRad= In-situ Radical assisted deposition

Other Product

ALPHA（α）-8SE

Thermal Processing System

CLEAN TRACK™

TEL's CLEAN TRACK™, advanced coater/developer systems are world-renowned for superior performance and reliability. Leading the industry, we design innovative track systems for 200mm and 300mm high volume production and 193nm processing and beyond. Based on the same platform used for lithographic coating and developing, we also offer spin-on-dielectric solutions with inline cure processing.

CLEAN TRACK™ LITHIUS™

Coater/Developer

The CLEAN TRACK LITHIUS is a next generation 300mm/200mm coater/developer for the 45nm node and beyond. In line with rapidly advancing market needs, the CLEAN TRACK LITHIUS has been developed based on three concepts; improved processing, short cycle times, and enhanced network solutions. TEL has applied the most advanced process technology to the CLEAN TRACK LITHIUS, enabling stable wafer processing. Furthermore the CLEAN TRACK LITHIUS has shorter lead and startup times. The system is designed with a metrology integration block, and offers increased network capability that integrates various advanced network technologies, such as eDiagnostics and APC.

＜Applications and Features＞

- ■ Thermally isolated design minimizes thermal interference
- ■ Standard core network solution, Ingenio™
- ■ Full system integration of measurement & inspection tools
- ■ Optimized integration with the exposure tool for maximizing litho cell throughput
- ■ Newly developed automatic position teaching tool and temperature adjustment tool
- ■ Two new models available :
  - ● LITHIUS e which has new functions optimized for each exposure light source
  - ● LITHIUS i+ developed for immersion technology

※CLEAN TRACK, LITHIUS and Ingenio are registered trademarks or trademarks of Tokyo Electron Limited in Japan and other countries.
＊Please refer to P17 for Timbre's optical measurement system.

CLEAN TRACK ACT™ 12　CLEAN TRACK ACT™ 8

Coater/Developer

The CLEAN TRACK ACT 12 and ACT 8 are the most reliable 300mm and 200mm coater/developers on the market. With thousands of systems shipped worldwide, the ACT series has proven hardware reliability and process stability that exceeds the most stringent photolithography requirements. With advanced process capabilities, the ACT series ensures a smooth transition from the R&D stage to a high-volume production setting. Airborne chemical filtration, innovative chemical dispense systems, and excellent thermal uniformity of PEB hotplates allow for state-of-the-art 193nm processing. High-speed robotics guarantee throughputs that meet the demands of the most advanced scanners. Optimized equipment accessibility and superior component reliability contribute to unsurpassed uptime performance. Furthermore, to meet the stringent demands of fully automated wafer processing, TEL offers a variety of in-line metrology solutions, including macro defect detection, bare silicon resist thickness uniformity measurement and optical CD measurement.

＜Applications and Features＞

- ■ High throughput
- ■ Compact footprint
- ■ Proven uptime
- ■ Advanced process capability
- ■ 300mm (200mm) factory automation integration
- ■ In-line metrology options
- ■ Remote recipe editor, data analyzer and reliability monitoring system

※CLEAN TRACK ACT is a registered trademark or a trademark of Tokyo Electron Limited in Japan and other countries.
＊Please refer to P17 for Timbre's optical measurement system.

CLEAN TRACK ACT™ 12 SOD　CLEAN TRACK ACT™ 8 SOD

SOD Coater

The CLEAN TRACK ACT 12 SOD / 8 SOD are 300mm and 200mm coat, bake, and cure tools for spin-on dielectric materials. Based on the same platform used for existing lithographic coating and developing, the CLEAN TRACK ACT SOD series has an evolutionary design that demonstrates exceptional reliability and productivity. TEL has developed innovative modules to process organic, inorganic, hybrid and porous materials for low-k dielectric applications. Single wafer in-line cure processing is accomplished with TEL's implementation of low oxygen hotplate technology. For high-throughput low-oxygen cure applications, TEL has developed a dedicated array of cure modules integrated within the CLEAN TRACK ACT platform.

＜Applications and Features＞

- ■ High productivity, high throughput, compact footprint
- ■ Low oxygen bake and cure capability
- ■ Single wafer, in-line cure process
- ■ Verification of oxygen control by lot
- ■ Supports SMIF interface

※CLEAN TRACK ACT is a registered trademark or a trademark of Tokyo Electron Limited in Japan and other countries.
＊Please refer to P17 for Timbre's optical measurement system.

CLEAN TRACK ACT™ M

Photomask Coater/Developer

The CLEAN TRACK ACT M is based on three separate high performance application modules; a photomask developer, resist coater, and PEB (Post Exposure Bake) baker. The system provides sophisticated process control and techniques to meet the needs of advanced industry requirements of OPC (Optical Proximity Correction), phase shifting, and the use of chemically amplified resists. Based on TEL's market-dominating CLEAN TRACK ACT platform, as well as many years of semiconductor wafer and flat panel display resist coating/developing experience, the system offers improved within-mask and mask-to-mask process uniformity with a reduction in the number of defects.

＜Applications and Features＞

- ■ Offers improved within-mask and mask-to-mask process uniformity
- ■ Supports SMIF interface

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Etch Systems

TEL is the world market share leader in dielectric etching. Our etch systems achieve first-rate process results on a wide range of plasma etch applications, including: SAC, Dual Damascene, Low-k dielectrics, Poly Gate, and Silicon Deep Trench Etch. The robust designs of our tools deliver production-worthy etch processes that are repeatable chamber-to-chamber.

Telius™

Plasma Etch System

The Telius, TEL's etch system for 300mm wafer production, offers wide process latitude and outstanding cost performance. The Telius SP version offers the best productivity, higher throughput, a smaller footprint, and electric energy consumption savings as standard features. Loading of the various chamber applications corresponding to a wide range of process domains is possible. TEL also offers a CIP (Continuous Improvement Package), a retrofit option for the SCCM™ chamber, to address the needs of future miniaturization and fast reduction of particle are realized.

＜Applications and Features＞

- DRM, SCCM Chambers
- Up to four chamber capability
  (photo shows two-chamber system)
- Flexible modular system expansion
- Same footprint as the 200mm UNITY™ IIe system
- High throughput, compact design and lower CoO
- Ease of maintenance
- 304, 305, and 308 models are available for the Telius

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※SCCM is a registered trademark or a trademark of Tokyo Electron Limited in Japan and other countries.
※UNITY is a registered trademark or a trademark of Tokyo Electron Limited in Japan and other countries.

UNITY™ Me

Plasma Etch System

UNITY Me continues to achieve excellent cost performance for the 130nm node and future technologe generations, resulting in higher productivity and reliability. The UNITY Me delivers world-class process results on a wide range of plasma etch applications, including HARC, Dual Damascene, low-k dielectrics, poly gate, and shallow trench etch.

＜Applications and Features＞

- DRM, SCCM™ Chambers
- Maximum four chambers capability
- High throughput, compact design and lower CoO
- Ease of maintenance
- Flow Control System

※UNITY is a registered trademark or a trademark of Tokyo Electron Limited in Japan and other countries.
※SCCM is a registered trademark or a trademark of Tokyo Electron Limited in Japan and other countries.

Tactras™

Plasma Etch System

The Tactras, the latest etch system enables vacuum continuation conveyance of 300mm wafer. By the pendulum type arm with a sliding mechanism, even a maximum of 6 chamber can install a process chamber, and the chamber for processing required after dry etching is extensible. A small footprint, energy saving, and improvement in a throughput are corresponded as same as Telius. The "equipment operation support function" aiming at improvement in operativity and productivity and the "wafer relief function at the time of an equipment stop" were carried.

＜Applications and Features＞

- SCCM™ Poly Chamber, Vigus™ Chamber, After Treatment Chambers
- Maximum six chambers capability
- Flexible modular system expansion
- High throughput, compact design and lower CoO
- Ease of maintenance

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※SCCM is a registered trademark or a trademark of Tokyo Electron Limited in Japan and other countries.
※Vigus is a trademark of Tokyo Electron Limited in Japan and other countries.

Surface Preparation Systems

TEL's Surface Preparation Systems produces advanced automated wet surface preparation systems designed specifically for sub-quarter micron FEOL/BEOL cleaning, etching, and photoresist stripping in 200mm and 300mm mass production environments. TEL's sophisticated tools outperform competitive systems in process performance and CoO.

EXPEDIUS™+

Auto Wet Station

The EXPEDIUS + is leading edge automated wet stations designed specifically for the most advanced FEOL cleans, etch, and resist strip in 300mm wafer mass production environments. The systems achieves excellent process performance and productivity. This device designates the mass production of minuteness process after 65nm as the target, and corresponds to the wafer finishing which needs superior process technology. Chemical processing & rinse tank were optimized in order that it corresponds to the FEOL process which especially is needed harsh process efficiency in washing process. SD2 the TEL's original dryer, that has no boundary tension consern which is easy to cause the pattern destruction on the wafer, has been adjusted for decreasing beyond 65nm level minuteness particles. In addition, substantial productivity improvement will be possible from EXPEDIUS +, with adopting compact and new carrier system of high throughput correspondence. Furthermore, batch formation mechanism was lined up as an option, it became possible to do the repeatable process processing, regardless of the wafer quantity and processing position.

＜Applications and Features＞

- ■ Linear and overall footprint reduction (20% reduction)
- ■ Cassette-less wafer transport with 50-wafers batch size and narrow pitch processing. Maximum 600w/h.
- ■ Design standardization (Module/Unit concept) for reduced delivery interval, startup time, and inventory requirement
- ■ Multiple chemistry processing in a new single point-of-use bath; Mega Flow Bath (MFB).
- ■ New Stacked Dual Chamber Dryer (New SD2) with in-situ chemical injection for process flexibility and watermark-free drying performance.
- ■ Ingenio™ Performed : Reduction of product downtime by adding the FDC and maintenance support

※EXPEDIUS is a trademark of Tokyo Electron Limited in Japan and other countries.
※Ingenio is a registered trademark or a trademark of Tokyo Electron Limited in Japan and other countries.

Certas™

Pre-clean System

Certas provides advanced surface pre-clean capabilities with enhanced enviromental health and safety performance. Fully automated dry clean units dramatically reduce the CoC (Cost of Consumable) by avoiding the use of wet chemicals. Water Mark less, Unique Si-dioxide selectivities, Damage Free, High Uptime by plasma-less dry clean support various applications from a mass production to R&D.

＜Applications and Features＞

- ■ Single & Dry process surface preparation units ■ Unique Si-dioxide selectivities
- ■ Lower CoC as a result of reduced DIW, chemicals, and exhaust requirements
- ■ Damage less process and Higher uptime by plasma less process
- ■ Simple design for reduced footprint and enhanced maintainability ■ 200/300mm wafers

※Certas is a registered trademark or a trademark of Tokyo Electron Limited in Japan and other countries.
＊Adopting Telius, a high reliable platform proven in etch systems.

CELLESTA™

Single Wafer Cleaning System

The CELLESTA is the latest single wafer cleaning system developed for FEOL critical clean processing. Utilizing three process modules, it has the flexibility to run a wide variety of FEOL clean applications on its three available process modules.

- ●SC1 and SC2 Spin process chamber for highly controllable, heated wet chemical processing
- ●HF spin process chamber for highly uniform etching
- ●SVOS unit (Single Vapor Ozone Strip) for photo resist removal with DIW vapor & O_3 gas

Combinations of these chambers can successfully process the most advanced technologies facing today's semiconductor industry. TEL's original drying technology solves problems generally associated with standard drying techniques, including eliminating watermarks and damage on sensitive structures. CELLESTA offers the highest process performance & the maximum cost performance for 65nm high volume production and beyond.

＜Applications and Features＞

- ■ Damage free particle removal and minimal oxide loss with the Atomized Spray II.
- ■ Superior process performance and low chemical consumption
- ■ Watermark free drying system with no pattern collapse
- ■ Single Vapor Ozone resist removal System (SVOS)
- ■ Three process modules options for a variety of FEOL applications
- ■ SEMI S2-0200, CE Mark, FM
- ■ Ingenio™ Performed : Reduction of product downtime by adding the FDC and maintenance support capabilities

※CELLESTA is a trademark of Tokyo Electron Limited in Japan and other countries.
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TEL NS300

Scrubber System

The TEL NS300 wafer scrubber system provides 300mm process yield enhancement through unique cleaning methods. Based on the CLEAN TRACK ACT™ 12 platform, the TEL NS300 delivers reliable performance with a variety of particle removal processes. The system features all the cleaning methods of the 200mm SS-series scrubber as well as newly developed technologies.

＜Applications and Features＞

- ■ FOUP (3 to 4) or open cassette
- ■ CLEAN TRACK ACT 12 transfer method and software
- ■ Vacuum and mechanical chuck for cleaning on both sides
- ■ Variety of cleaning methods: Brush (for top side and back side)/Jet/Megasonic/Atomized Spray/SC-1
- ■ CO_2 injection capability ■ GEM host communication
- ■ S2-0200 and CE mark compliance
- ■ Ingenio™ :Simplification of data analysis by process data management, tool status monitoring function

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※Ingenio is a registered trademark or a trademark of Tokyo Electron Limited in Japan and other countries.

Single Wafer Deposition

TEL's Single Wafer Deposition provides single wafer metal CVD systems and plasma processing systems that meets the most advanced system needs with ease of maintenance. The metal CVD system "Trias" utilizes heat and plasma to form metal film or diffusion preventative film. It maintains high market share among DRAM applications. Trias SPA provides nitridation or oxidation of gate dielectrics. Utilizing plasma enables high quality and low-electricity leak dielectrics.

Trias™

Single Wafer CVD System

Trias is a common platform for single wafer CVD module, which realizes high productivity and small footprint.
By adopting universal plug-in concept, Trias can cluster newly developed single wafer CVD modules, designed to meet the requirements of sub-65nm processes and beyond.
Unique plasma-free chamber cleaning technology is adopted for process modules, and then high productivity and low CoC (Cost of Consumable) can be realized.

＜Applications and Features＞

- Wafer size: 300mm
- Number of process modules: 1 to 4
- Processes performed: Pre-clean, Ti, TiN, LT Ti, SFD TiN, W, DCS WSi
- Plasma-free chamber cleaning

※Trias is a registered trademark or a trademark of Tokyo Electron Limited in Japan and other countries.

Trias™ SPA

Plasma Processing System

The Trias SPA is plasma treatment reactor for nitridation of gate dielectrics for the 90nm node and beyond. Additional applications include thin and thick-film oxidation, recovery oxidation, shallow trench isolation and refinement of various films, including high-k materials. The reactor is based on unique Slot Plane Antenna (SPA) plasma technology, which creates a high-density, low-electron temperature plasma with excellent uniformity, thus enabling stable, damage-free plasma processing without subsequent annealing, improving the speed and high reliability transistor fabrication.

＜Applications and Features＞

- Wafer size: 200mm, 300mm
- Number of process modules: 1 to 4
- Wide range of process applications such as oxidation, and post-treatment of various films

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UNITY™-EP

Single Wafer CVD System

UNITY -EP is 200mm single wafer metal CVD system that utilize $TiCl_4$ precursors for high step coverage Ti and TiN processes. It can be adopted to future generation device requirement with lower temperature process in addition to the conventional high temperature process requirement.
Unique plasma-free chamber cleaning technology is adopted for process modules, and then high productivity and low CoC (Cost of Consumable) can be realized.

＜Applications and Features＞

- Wafer size: 200mm
- Number of process modules: 1 to 4
- Processes performed: Pre-clean, Ti, TiN, LT Ti, SFD TiN
- Plasma-free chamber cleaning

※UNITY is a registered trademark or a trademark of Tokyo Electron Limited in Japan and other countries.

Test Systems

With the largest market share worldwide, Test Systems has a history of leading the market in technological advancements. As testament to our quality workmanship and dedication to equipment reliability, TEL's first-generation probers are still in production today.

Precio™

Wafer Prober

Trends in the wafer probing arena dictate that a variety of probing capabilities be available to deal with fine pitch wafer processes, increasing functionality and content of devices, higher density of devices per wafer, and advances in packaging technologies. Precio, the newest addition to TEL's legendary line of wafer probers, was designed to lower overall test cell operating costs while providing maximum flexibility for these demanding market requirements. Through leverage of existing options and a new modular design, Precio contributes to lowering operating costs beyond the prober itself in areas such as tooling and probe card costs, labor, spares, and overhead. Precio maintains the TEL tradition of industry leading XY contact accuracy while enabling precision Z contact accuracy and control to stabilize contact resistance. Precio offers a new patented option for improved planarity between the chuck top and probe card, a critical requirement for optimized testing in high multisite and full wafer testing applications. And, Precio brings the option of a new inline high speed probe mark inspection capability, TELPADS-I, to drastically improve inspection functionality and throughput.

※Precio is a registered trademark or a trademark of Tokyo Electron Limited in Japan and other countries.

＜Applications and Features＞

■ High productivity ■ Small footprint ■ High reliability ■ Better Contact / Better Yield
■ Short Lead Time ■ TELPADS-I (Option) ■ Auto leveling (Option) ■ Zoom-1 (Option)

P-12XL/P-12XLn/P-12XLn+/P-12XLm

Wafer Prober

The P-12XL series of wafer probers is the industry benchmark for 300mm wafer testing. The systems retain TEL's acclaimed On-Axis-Alignment feature of previous models and eliminate probe pin placement errors under both high and low temperature conditions. The P-12XL series probers were designed for reduced pad sizes and their rigid, deflection resistant stage improve accuracy when handling higher pin counts. The P-12XLm is the flagship of the P-12XL series and is capable of superior alignment performance through enhanced optics capability.

＜Applications and Features＞

■ A high-accuracy and high-force resistance stage for optimal contact
■ Hot and cold temperature, heat dissipation thermal systems
■ Capable of handling CIM/FA, such as AMHS
■ Clean technology ■ PC-aided product file management and remote operation
■ Software compatibility with the P-8 series
■ 300mm, 200mm and 150mm (option) wafer size measurement capable

P-8XL/P-8XLm

Wafer Prober

The P-8XL series of wafer probers provide the optimum probing environment for 100, 150 and 200mm wafer testing. Based on TEL's On-Axis Alignment System, the P-8XL series satisfies the need for multi-DUT memory devices and high-speed multi-pin logic devices. This is achieved through an expanded Automatic Set-Up (ASU) card alignment area and a rigid Z stage. The P-8XLm incorporates technology advancements from TEL's market leading P-12XL 300mm wafer prober to improve accuracy.

A new, high rigidity Z stage can handle higher pin count probe cards with less horizontal and vertical deflection. And a new optics system improves alignment of fine pitch probes and allows for the P8XLm to address applications with tighter design rules.

＜Applications and Features＞

■ Rigid XYZ stage with high accuracy ■ High accuracy on-axis alignment
■ Fully Integrated High and Low Temperature Thermal Systems
■ PC-aided product file management and remote operation
■ TRX chuck top for low leakage current ■ Software compatibility with TEL's other P-8 series

WDF™ DP

Wafer/Dicing Frame Prober

The WDF DP offers the dual functionality of a wafer prober and a dicing frame handler, and is specifically designed for CSP/WLCSPs, one of the fastest growing markets in recent years. A unique design enables the WDF DP to handle both regular wafers and wafers/substrates on dicing frames, resulting in production efficiency improvements. In addition, the WDF DP helps reduce test costs by allowing functionality to be switched without a change-over-kit and providing a faster index time compared to conventional handlers.

＜Applications and Features＞

■ Wafer and dicing frame handling capability without a change-over-kit
■ Over twice the throughput of conventional horizontally moving handler
■ Special alignment available for diced wafers
■ Hot temperature testing (max :150℃) ■ Flat-top for large test-head support

※WDF is a registered trademark of Tokyo Electron Limited in Japan and other countries.

TELPADS-O (TEL Probing Accuracy Diagnosis System-Offline)

High-speed Probe Mark Automatic Inspection System

TELPADS-O provides throughput improvements of up to 50x compared to current probe mark inspection (PMI) capabilities. Integration with TEL's fully automatic wafer prober creates an automated offline PMI solution that allows customers to maximize uptime of the test cell. TEL's automated PMI methodology eliminates the need for manual inspection with a microscope, thereby reducing the need for operator interaction.

＜Applications and Features＞

■ High Speed engine allows for PMI of all pads and all wafers
■ Capable of providing quantitative data for analysis and quality control
■ Reduced Operator Interaction ■ Support for various pad types

PN-300

Data Management System for Wafer Prober

The Wafer Prober Networking System PN-300 utilizes a database to enable data flexibility and access from other systems. The system performs a wide-range of unique functions through standard hardware and operating system. In addition, wafer prober operation and maintenance is further supported by equipping it with an N-PAF (Network-based Prober Advanced Function).

＜Applications and Features＞

■ Based on Windows OS
■ SEMI standard compliant, HSMS, GEM
■ Software structure handles independent tasks
■ Various Windows OS compliant applications (Excel, Visual Basic, RDBM)

N-PAF (Network-Based Prober Advanced Function)

Operation Support System for Wafer Probers

The N-PAF is a networking system developed for more effective operation and maintenance of multiple wafer probers. The system offers a wide range of unique applications through a standard hardware and an operating system.

＜Applications and Features＞

■ Setup file distribution and archiving
■ Control map creation ■ RAM analyzer
■ Remote control operation ■ Floor viewer
■ Remote software installation

※Windows® and Visual Basic are registered trademarks or trademarks of Microsoft Corporation in the United States and other countries.
＊Full name of Windows® is Microsoft® Windows® operation system.

FPD Systems

The expanding flat panel display market has high future growth potential. TEL's plasma etch/ash systems and coater/developer systems for the flat panel display production equipment market are manufactured at Tokyo Electron AT, a subsidiary of TEL, and TEL's coater/developer are developed and manufactured by Tokyo Electron Kyushu, another subsidiary of TEL.

Impressio

FPD Plasma Etch/Ash System

In addition to high etching rates, etching uniformity has become an increasingly important factor for larger substrate etching. Impressio adopted a new chamber mode ECCP (Enhanced Capacitively Coupled Plasma) to realize equalization of plasma density and high efficiency etching. It realizes performance more than the 6th generation system. Also, the Impressio has various process applications, from Si etching to metal etching.

＜Applications and Features＞

- Chamber Mode : ECCP (Enhanced Capacitively Coupled Plasma)
- P/C Open/Close : Slide & rotation (TEL original)
- High throughput
- Multi-chamber system
- Substrate size: <Standard> 1950mm x 2250mm

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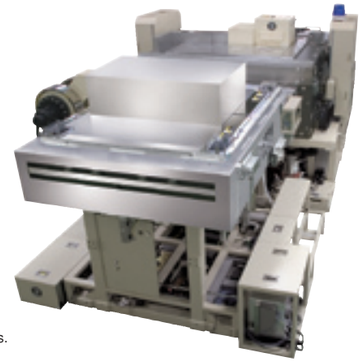
Successio

FPD Plasma Etch/Ash System

The Successio series has evolved from the 5th generation single-chamber system by a 25% reduction in the size of the transfer unit. Its simple design reduces downtime caused by unexpected problems.



＜Applications and Features＞

- Substrate size: <Standard> 1500mm x 1850mm
- Chamber Mode : FPE/RIE mode selectable
- P/C Open/Close : Slide & rotation (TEL original)
- Process performance is same level as 5th generation system

※Successio is a registered trademark or a trademark of Tokyo Electron Limited in Japan and other countries.

CL1700

FPD Coater/Developer CRYSTAL LINER™ Series

System concepts have evolved from the conventional CS series system to process larger substrates (6th generation) and to accommodate a smaller system footprint. The system utilizes a roller transfer method to stabilize transfer of substrates.

＜Applications and Features＞

- Substrate size: <Standard> 1500mm x 1850mm
- Scrubber/developer unit design conserves space
- High-speed scan puddle developer achieves a high critical dimension uniformity

※CRYSTAL LINER is a registered trademark or a trademark of Tokyo Electron Limited in Japan and other countries.

HT-800 HT-910

FPD Plasma Etch/Ash System

The max four chamber HT series FPD plasma etch/ash system realizes excellent cost performance in a system of α-Si TFT and LTPS TFT. The system maintains the proven reliability of the ME series, and achieves a high transfer speed through the adoption of a unique transfer system.

＜Applications and Features＞

- High process performance in various applications
- Superior configuration control and uniformity
- Chamber mode: Free combination of PE/RIE/ICP
- Substrate size: HT-800 <Standard> 680mm x 880mm
  HT-910 <Standard> 730mm x 920mm

Additionally, based on TEL's accumulated process data and the setting of process parameters, the HT series is suitable for a wide range of applications. The interface enables full compatibility with AGV/CIM systems (option).

CS1000S

FPD Coater/Developer Crystal Spinner Series

CS1000S is based on the field-proven CS series' system concept. Various technologies has been adopted for high density applications.

＜Applications and Features＞

- Scrubber/Developer unit is spinless-track type
- The multi unit access function achieves flexible substrate transportation
- The coater unit corresponds, both spinless slit coater and spin coater

Other Products

SE-1210 SE-1310

FPD Plasma Etch/Ash System

- Substrate size: SE-1210 <Standard> 1000mm x 1200mm
  SE-1310 <Standard> 1100mm x 1300mm

ME-500 ME-600 ME-700

FPD Plasma Etch/Ash System

- Substrate size: ME-500 <Standard> 400mm x 500mm
  ME-600 <Standard> 550mm x 650mm
  ME-700 <Standard> 600mm x 720mm

CL1200 CL1300

FPD Coater/Developer CRYSTAL LINER™ Series

- Substrate size: CL1200 <Standard> 1000mm x 1200mm
  CL1300 <Standard> 1100mm x 1300mm

CS500 CS600 CS800S CS800L

FPD Coater/Developer Crystal Spinner Series

- Substrate size: CS500 <Standard> 400mm x 500mm
  CS600 <Standard> 550mm x 650mm
  CS800S <Standard> 600mm x 720mm
  CS800L <Standard> 680mm x 880mm

ODP (Optical Digital Profilometry)

In production at leading memory and logic device manufacturers around the world, Timbre's innovative Optical Digital Profilometry (ODP) technology is used as a stand-alone metrology solution and as an integrated system with TEL's Semiconductor Production Equipment for wide variety of applications.

TeraGen

Library Generation System for ODP (Optical Digital Profilometry)

TeraGen offers dual mode functionality for Optical Digital Profilometry (ODP), with superior run-time regression profiles and fast and easy automated on-site library generation.

＜Applications and Features＞

- Suited for all fab environments: from R&D to volume production
- Automated, fast and user-friendly system

＊ Please contact a TEL representative from the AIM Dept. for detailed information.

ODP (Optical Digital Profilometry)

Optical Measurement System for CD, Profile and Film Thickness

ODP (Optical Digital Profilometry) is an unique technology used for measurement of CD (Critical Dimension), profile and film thickness. The system provides high speed and high precision non-destructive measurement capabilities with state-of-the-art technologies. ODP contributes to further improvements in various applications of process control.

＜Applications and Features＞

- Revolutionary high speed processing and high precision
- CD, profile and film thickness in one measurement
- Fab-Wide solution used in both stand-alone and integrated metrology
- Flexible, user friendly operations

MEMS Business

MEMS stands for Micro Electro-Mechanical Systems and is sometimes referred to as "Micro-machine" in Japan or MST (Micro System Technology) in Europe. MEMS devices are typically manufactured using a silicon fabrication process. The micro-mechanical structure of a MEMS device is processed at a micron to sub-millimeter scale on Silicon substrate and is then used in sensor, actuator, or other applications. Today this technology is being considered for use in super high density 3-dimensional packaging techniques such as CoC (Chip on Chip) or WoW (Wafer on Wafer). TEL offers unique manufacturing and test equipment for the fabrication of MEMS devices. This ability to create these innovative solutions is made possible through TEL' s extensive experience in the Semiconductor market. TEL can also provide process and prototyping services to customers who would like to design and develop MEMS devices using an in-house 6" MEMS fabrication line.

TEMEON™

Wafer level MEMS tester

TEMEON is a system designed to test and evaluate both the electrical and previously untested mechanical characteristics of MEMS devices at the wafer level by applying a unique local vibration stimulus input. In addition, TEMEON makes use of an ultra low force and low Cres contact technology that enables much more accurate measurement of the dynamic characteristics of these sensitive MEMS devices. The TEMEON functionality can be realized with commercially available wafer probers.

＜Applications and Features＞

- Local vibration stimulus input technique
- Ultra low force contact / Low Cres contact technology
- Wafer handling/chuck technology (Wafer with through hole)

※TEMEON is a trademark of Tokyo Electron Limited in Japan and other countries.

AIM (Advanced Inspection & Metrology)

TEL's Advanced Inspection & Metrology (AIM) Department provides advanced inspection tools manufactured by top suppliers from around the world. The semiconductor industry's most innovative defect inspection system is the e-beam. The tool provides the best sensitivity and imaging available for improving yields and enabling next generation technologies.

eScan® 380 Hermes Microvision, Inc.

Electron-Beam Defect Inspection System

The eScan 380, a collaboration between TEL and Hermes Microvision, Inc., is the most advanced e-beam defect inspection tool available to the semiconductor industry.

＜Applications and Features＞

- Unparalleled design for both voltage contrast and critical physical defect detection
- Ultra-low landing energy enables detection of VC defects critical for 65nm and 45nm technologies
- Continuous pixel to cover wide range
- E-beam column optimized for production
- Real time review and ADC provide fastest time to results

※eScan is a registered trademark of Hermes Microvision, Inc. in the United States Patent and Trademark Office.

Other Product

eProfile®

Electron-Beam Process Monitoring System

※eProfile is a registered trademark of Hermes Microvision, Inc. in the United States Patent and Trademark Office.